

In the Claims:

1. (Currently amended) A storage apparatus, comprising:
 - a processor;
 - a memory;
 - at least one ~~of a plurality of~~ storage device devices;
 - a storage controller, coupled to ~~with~~ the at least one ~~of a plurality of~~ storage device devices;
 - a network interface connectable to a virtual local area network (VLAN) switch;
 - wherein the processor is at least intermittently coupled to ~~with~~ the memory, the storage controller and the network interface;
 - wherein the memory comprises configuration information including a correspondence between at least one segment ~~of a plurality of segments~~ of a virtual local area network (VLAN) connectable by the network interface and at least one ~~of a plurality of~~ virtual volume volumes of the at least one ~~of a plurality of~~ storage device devices; and
 - wherein the processor, the memory, the storage controller and the network interface are operable to control the virtual ~~a virtual~~ local area network (VLAN) switch to map the at least one segment ~~of a plurality of segments of a virtual local area network (VLAN)~~ ~~connectable by the network interface~~ to the at least one ~~of a plurality of~~ virtual volume volumes ~~of the at least one of a plurality of storage devices~~ based upon the configuration information.
2. (Original) The apparatus of claim 1,
 - further comprising an out of band management interface connectable to a second network.
3. (Original) The apparatus of claim 1,
 - wherein the network interface connectable to a virtual local area network (VLAN) switch comprises an interface to a VLAN trunk line.
4. (Original) The apparatus of claim 3,

wherein information carried by the VLAN trunk line is identified using an embedded tag.

5. (Currently amended) The apparatus of claim 1,
wherein the network interface connectable to a virtual local area network (VLAN) switch comprises an interface to a VLAN switch, the VLAN switch connectable to at least one of a plurality of host ~~computer computers~~ via at least one of a plurality of VLAN access link links.

6. (Currently amended) The apparatus of claim 5,
wherein information carried by the at least one of a plurality of VLAN access link links comprises untagged frames.

7. (Currently amended) The apparatus of claim 6,
wherein information carried by the at least one of a plurality of VLAN access link links is identified using a VLAN Identifier of a receiving port.

8. (Currently amended) The apparatus of claim 6,
wherein information carried by the at least one of a plurality of VLAN access link links is identified using a Media Access Control (MAC) address.

9. (Original) The apparatus of claim 6,
wherein an untagged frame comprises:
a preamble field;
a source MAC field;
a destination MAC field;
a type field;
a data field; and
a CRC field.

10. (Currently amended) A method, comprising:

separating logically a local area network into a plurality of virtual local area networks, including a first virtual local area network and a second virtual local area network;

separating logically a storage device into a plurality of virtual volumes, including a first virtual volume and a second virtual volume;

mapping the first virtual local area network to the first virtual volume and the second virtual local area network to the second virtual volume to form a configuration; and

routing information from the first virtual local area network to the first virtual volume and the second virtual local area network to the second virtual volume and preventing communication from the first virtual local area network to the second virtual volume and from the second virtual local area network to the first virtual volume based upon the configuration.

11. (Original) The method of claim 10,
further comprising at least one of:
configuring network parameters;
configuring a new file system;
configuring a designated file system; and
deleting a designated file system.
12. (Original) The method of claim 10,
further comprising at least one of:
updating a management interface IP address;
updating a physical network interface IP address;
updating a VLAN interface IP address and a VLAN tag;
deleting a designated VLAN interface; and
adding a new VLAN interface.
13. (Original) The method of claim 10,
further comprising at least one of:
adding a VLAN to a file system;
removing a VLAN from the file system;

adding a volume to the file system; and
removing a volume from the file system.

14. (Original) The method of claim 10,
further comprising:
authenticating user authority.
15. (Currently amended) A computer program product, comprising:
code for sending and receiving tagged frames to and from a network interface;
code for managing a file system;
code for managing a virtual volume within the file system;
code for controlling data transfer between the network interface and a storage
controller of the file system;
code for routing information from a virtual local area network to a virtual volume
in the file system and preventing communication from at least one other virtual local area
network to the virtual volume based upon a configuration; and
a computer readable storage medium for holding the codes.
16. (Original) The computer program product of claim 15,
further comprising at least one of:
code for receiving configuration information for the file system;
code for receiving configuration information for the virtual volume; and
code for receiving configuration information for the virtual local area network.
17. (Original) The computer program product of claim 16,
further comprising at least one of:
code for updating configuration information for the file system;
code for updating configuration information for the virtual volume; and
code for updating configuration information for the virtual local area network.

18. (Currently amended) A computer apparatus, comprising:
a means for processing information;
a means for connecting to a virtual local area network (VLAN) switch;
wherein the means for processing and the means for connecting to a virtual local area network (VLAN) switch are connectable to an external storage device having at least one virtual volume of a plurality of volumes mapped to at least one segment of a plurality of segments of a virtual local area network (VLAN) based upon configuration information, thereby preventing communication between another segment of another VLAN and the at least one virtual volume.

19. (Currently amended) A storage apparatus, comprising:
a means for processing information;
a means for storing data;
a means for controlling storing of data;
a means for connecting to a virtual local area network (VLAN) switch;
wherein the means for processing, the means for controlling storing of information and the means for connecting to a virtual local area network (VLAN) switch map at least one segment of a plurality of segments of a virtual local area network (VLAN) to at least one virtual volume of a plurality of virtual volumes of the means for storing storage data based upon configuration information and prevent communication between another segment of another VLAN and the at least one virtual volume.

20. (Currently amended) A system, comprising:
a storage device;
a virtual local area network (VLAN) switch, coupled to the storage device; and
at least one segment of a plurality of devices coupled to the virtual local area network (VLAN) switch via at least one of a plurality of virtual local area network networks;
wherein the storage device is operable to control the virtual local area network (VLAN) switch to map the at least one segment of a plurality of segments of the at least one of a plurality of virtual local area network networks to at least one of a plurality of virtual volume

~~volumes of the at least one of a plurality of storage device devices~~ based upon configuration information, and is operable to prevent another segment of another VLAN from communicating with the at least one virtual volume of the storage device.

21. (Currently amended) A method of controlling accesses from servers at a disk subsystem, wherein the disk subsystem is connected to a virtual local area network (VLAN) switch via a VLAN trunk and receives access requests from the servers via the VLAN switch and the VLAN trunk, the method comprising the steps of:

allocating a dedicated storage resource to each VLAN segment,
receiving a Internet Protocol (IP) packet based access from a server,
determining a VLAN segment that the server belongs to, based on a VLAN identification in the IP packet, and
permitting the server to access the dedicated storage resource allocated to the VLAN segment that the server belongs to, and preventing another server that does not belong to the VLAN segment from accessing the dedicated storage resource.

22. (Currently amended) A method, comprising:
separating a virtual LAN ~~lan~~ into a plurality of segments;
mapping each one of the plurality of segments to a storage device; and
assigning at least one ~~of a plurality of virtual volume volumes~~ to each one of the plurality of segments, such that a virtual volume will communicate only with a segment to which it is assigned.